

Observations on *Hexapanopeus schmitti* Rathbun from Brazil (Crustacea: Decapoda: Xanthidae)

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Abstract.—Observations are presented on members of a population of *Hexapanopeus schmitti* Rathbun from Pitangui, Rio Grande do Norte, Brazil. This species is very small, apparently not exceeding 10 mm in carapace length. It is illustrated in detail as are the gonopods of the four species of *Hexapanopeus* known from Brazil. A key to Brazilian species of *Hexapanopeus* is provided.

Field studies along the coast of Rio Grande do Norte, Brazil by one of us (C.S.) yielded a series of specimens of *Hexapanopeus schmitti* Rathbun, 1930, originally described from material from localities in Brazil and Uruguay. The population recorded here shows wide variation in color pattern that has not been recorded previously. Gonopods are illustrated for the four Brazilian species of *Hexapanopeus*, and a key to those species is presented.

Abbreviations used in the accounts below include: cb, carapace breadth; cl, carapace length; mm, millimeter; P1-5, first to fifth pereopods (P1 is the cheliped, P2-5 the walking legs). USNM is an acronym for the National Museum of Natural History, Smithsonian Institution, Washington, D.C., where some of the newly-collected specimens are deposited. The majority of the specimens are in the collections of the Museu do Mar "Onofre Lopes" at the Universidade Federal do Rio Grande do Norte, Natal, Brazil.

Family Xanthidae MacLeay, 1838

Hexapanopeus Rathbun, 1898

Hexapanopeus schmitti Rathbun, 1930

Figs. 1–4, 5e–h

Hexapanopeus schmitti Rathbun, 1930:393,
pl. 169, figs. 3–5. Type locality Bay of

Rio de Janeiro [22°54'S, 43°14'W], Rio de Janeiro State, Brazil.—Coelho & Ramos, 1972:191 [listed].—Melo, 1985:105 [Pernambuco, Rio de Janeiro, and São Paulo states, Brazil].—Melo et al., 1989:15 [Paraná].—Bakker et al., 1989:137, figs. 1–10 [Paraná; larval development].—Melo, 1996:360 [Brazil].

Material.—Brazil: Rio de Janeiro State, bay of Rio de Janeiro (22°54'S, 43°14'W), leg. W. L. Schmitt, 1925: 1 ♂ (holotype, USNM 59831).—Rio Grande do Norte State, intertidal region of Pitangui and estuary of River Potengi (5°47'S, 35°16'W), leg. C. Sankarankutty, 1995: 12 ♂♂, 12 ♀♀ (Museu do Mar "Onofre Lopes"; 1 ♂, 1 ovigerous ♀, USNM 284138).

Size.—Males, 3.4 by 4.6 mm (cl by cb) to 5.7 by 7.5 mm; non-ovigerous females, 3.0 by 3.8 mm to 5.7 by 7.8 mm; ovigerous females 4.1 by 5.3 mm to 5.3 by 7.7 mm. The holotype measures 9.4 by 12.8 mm (Rathbun, 1930:394).

Color (Fig. 4).—Variable but most live specimens are greenish-grey or pink in color; fronto-orbital border and anterolateral margins of carapace often bordered with white; fingers of chelae black except for tips.

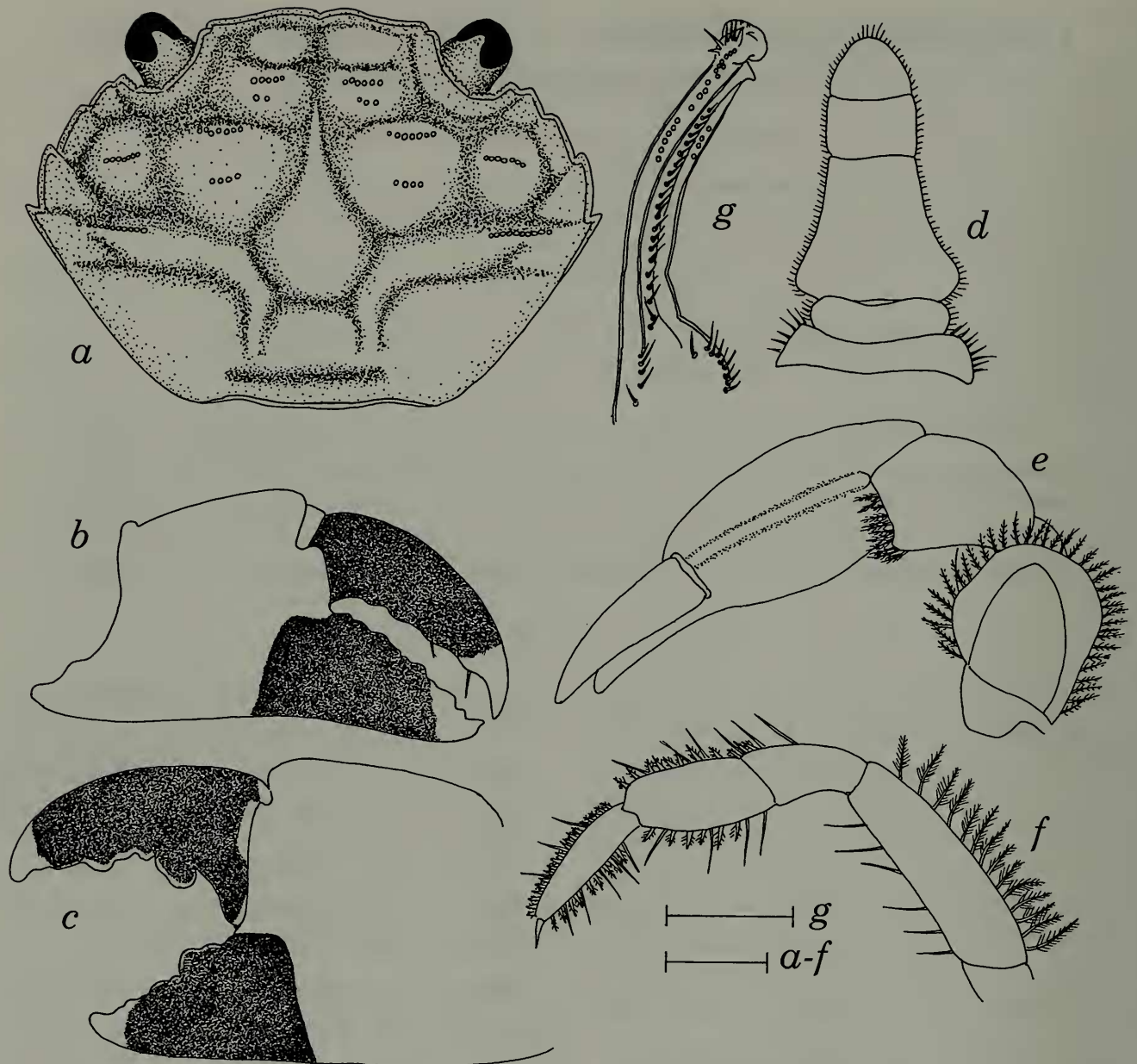


Fig. 1. *Hexapanopeus schmitti* Rathbun. Composite figure based on several specimens. Pitangui. *a*, Carapace showing rim around anterolateral and frontal margins; *b*, Right chela, outer face; *c*, Left chela, outer face; *d*, Abdomen of male; *e*, Cheliped (P1), dorsal view; *f*, Third walking leg (P4), posterior face; *g*, Gonopod. Scale *a-f*, 1 mm; scale *g*, 0.5 mm.

The majority of the freshly preserved specimens presented a uniform greyish green coloration while it was not uncommon to see a large variety of color patterns, some of which are depicted in Fig. 4. The carapace may be totally whitish with a few dark spots as in Fig. 4*b*; greyish green on most of its surface with a broad whitish band across the frontal and anterolateral regions (Fig. 4*c*, *e*). The carapace may also have a greenish background with a range of stripes extending posteriorly (Fig. 4*a*, *d*).

Chelipeds normally assume the color of the carapace, but in some cases both chelae were whitish or in one rare case only the small chela was whitish. In a majority of cases, the merus, carpus, and the exopod of the third maxilliped had a fine whitish border. Dactyli of all of the walking legs were whitish and in some cases the distal half of the propodus also was whitish.

Remarks.—Martin & Abele (1986) surveyed gonopods (first male pleopods) of crabs related to *Panopeus* H. Milne Edwards,

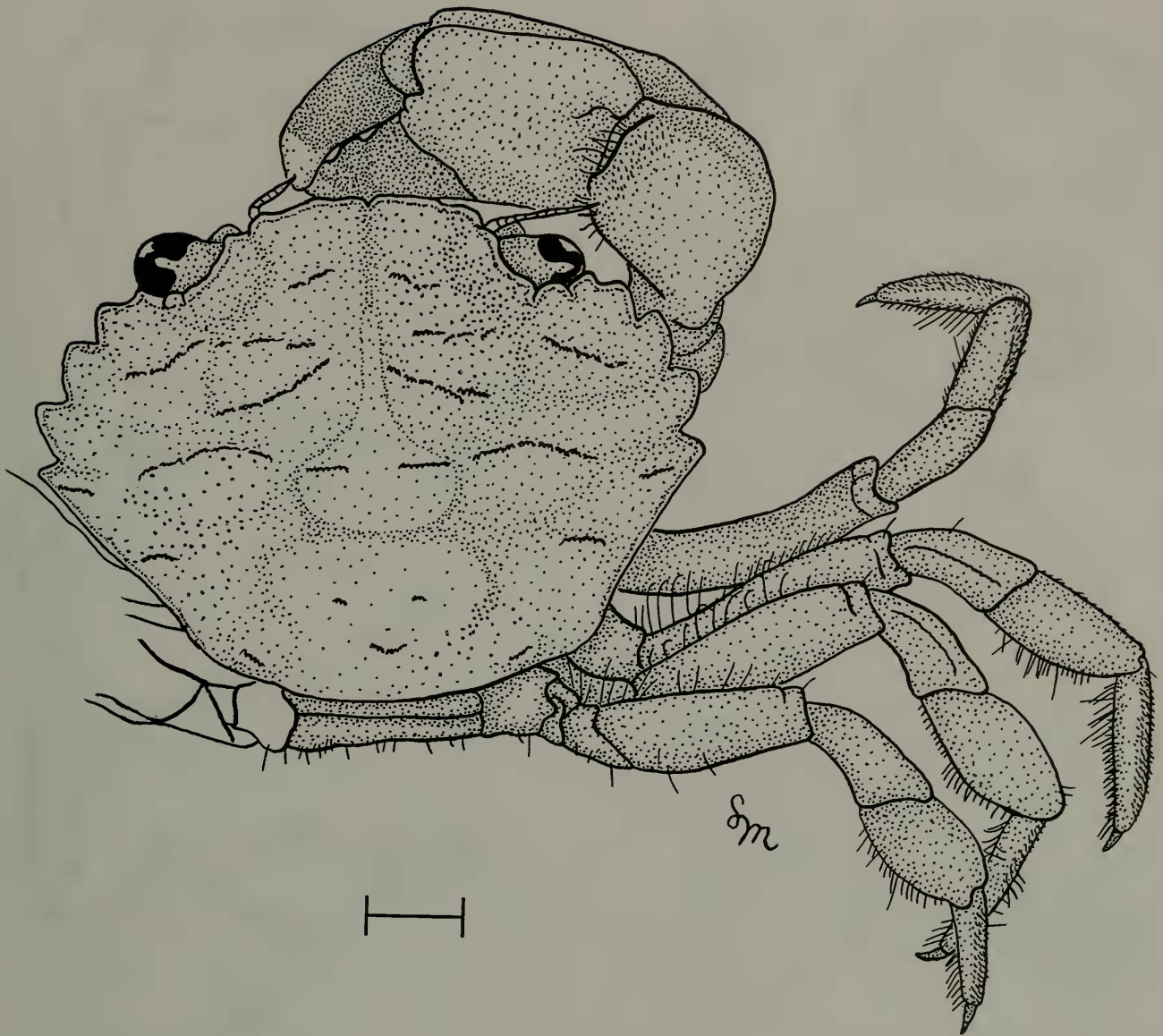


Fig. 2. *Hexapanopeus schmitti* Rathbun. Male, cl 5.0 mm, Pitangui. Dorsal view. Scale = 1 mm.

1834, and they pointed out that the tips of the gonopods of two species of *Hexapanopeus* Rathbun, 1898, the type species, *H. angustifrons* (Benedict & Rathbun, 1891), and *H. paulensis* Rathbun, 1930, differ from those of *Panopeus* s.s. The apices of the gonopods of those species of *Hexapanopeus* do not resemble those of *Panopeus* s.s., as they lack the strongly trilobed apex, with a long, sharp accessory process, a shorter rounded process, and a lateral tooth, often bifid. The apices of the gonopods of the holotype of *H. schmitti* Rathbun, 1930 (Fig. 5e-h), shown here, are similar in shape to those of *H. angustifrons* (Fig. 5i) but differ in having apical spines. The gonopod of *H. paulensis* (Fig. 5c, d) differs from that of species of *Panopeus* s.s. in

having a trilobed apex with much smaller lobes.

In contrast, the apices of the gonopods of *H. beebei* Garth, 1961, from the eastern Pacific, have a long, tapering lateral tooth, a similarly shaped accessory process, and a rounded median process with three terminal spines (Martin & Abele 1986:fig. 3d). This agrees with the shape of the tip of the gonopods in the western Atlantic *H. caribbaeus* (Stimpson 1871) (Fig. 5a, b), the fourth nominal species of *Hexapanopeus* from Brazilian waters, in which the median process is ornamented with more terminal spines. As pointed out by Martin & Abele (1986:185), *Hexapanopeus* as currently understood contains at least two very distinct

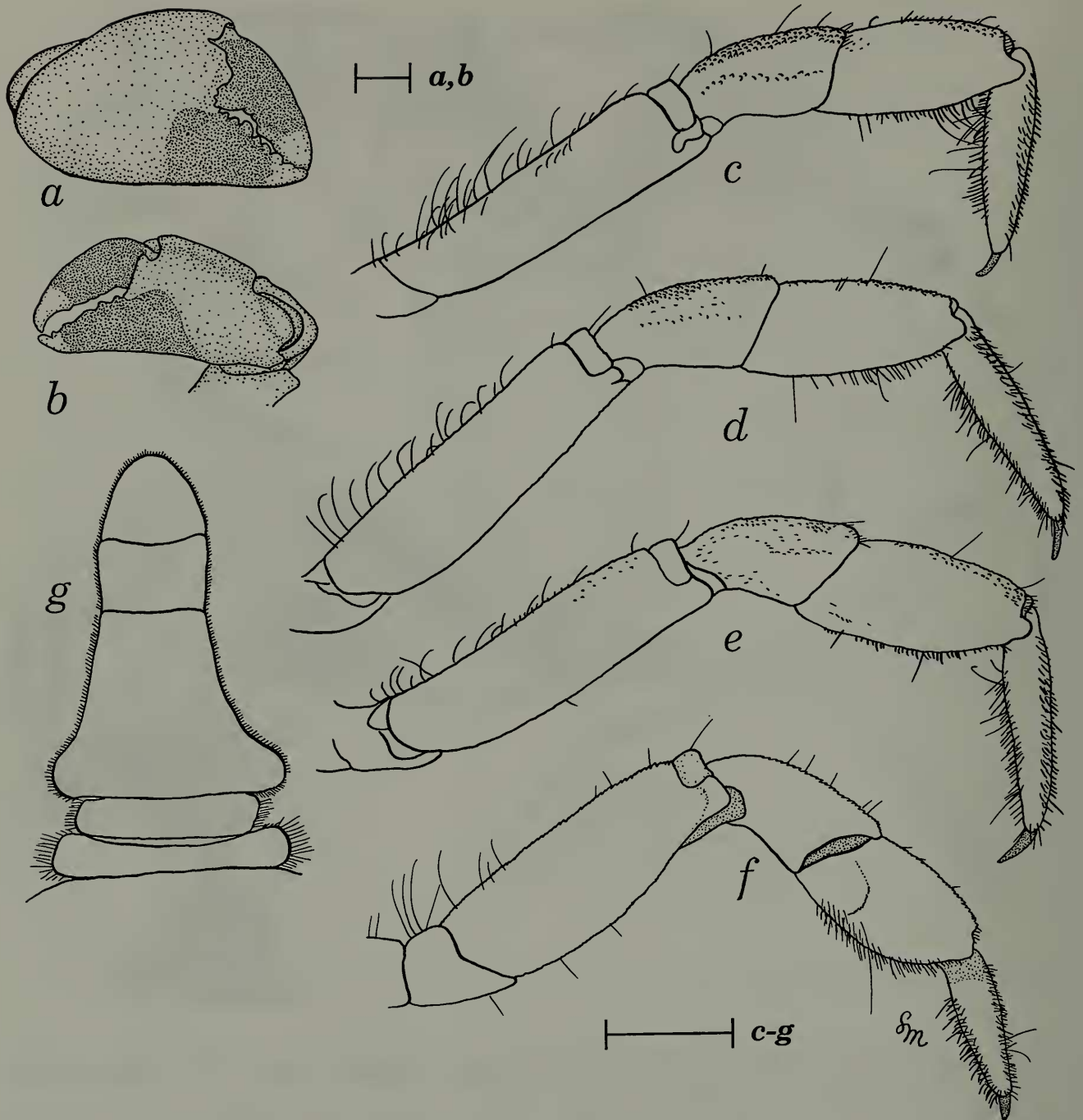


Fig. 3. *Hexapanopeus schmitti* Rathbun. Male, cl 5.0 mm, Pitangui. *a*, Right chela, outer face; *b*, Left chela, outer face; *c*, First walking leg (P2); *d*, Second walking leg (P3); *e*, Third walking leg (P4); *f*, Fourth walking leg (P5); *g*, Abdomen. Scales = 1 mm.

types of gonopods, that found on *H. angustifrons* and that found on *H. caribbaeus*. Indeed, as pointed out below, there may be three types of gonopod in different representatives of the genus.

The gonopod of *H. paulensis* from Brazil resembles that of *H. paulensis* from North America (see Williams 1984:410, fig. 331o) in shape but differs in ornamentation. In the Brazilian specimens the accessory process

is covered with much larger spines. The gonopod of *H. paulensis* illustrated in Williams (1965:200, fig. 183E) apparently is based on another, undetermined species; it resembles that of *H. schmitti*.

The gonopod of *H. angustifrons* (from Williams 1965:200, fig. 183D) is shown here (Fig. 5i) for comparison with the gonopods of the other three species of the genus known from Brazil. It appears to rep-

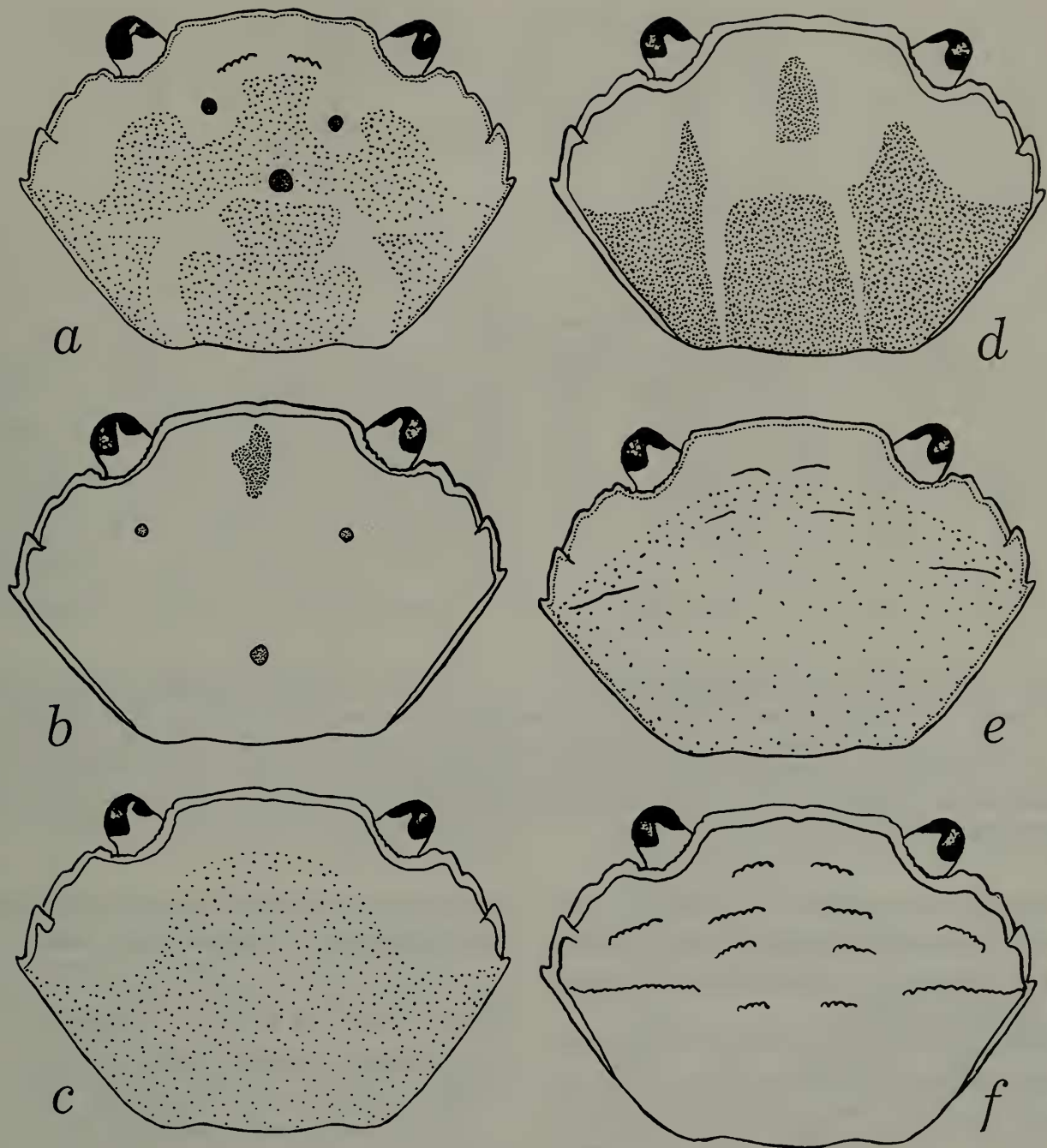


Fig. 4. *Hexapanopeus schmitti* Rathbun. Diagrammatic representation of common color patterns of specimens from Rio Grande do Norte.

resent a third type of gonopod within the genus, one with poorly developed lobes that also lacks distal spines. We have seen no material of *H. angustifrons* from Brazil, but it has been recorded from Maceio, Bahia, Rio de Janeiro, and Santa Catarina by Melo (1985), and from Pernambuco by Coelho Filho, Coelho Santos, & Coelho (1994). Melo (1996:357) gave its range in Brazil as from Pernambuco to Santa Catarina.

Rathbun (1930:393) commented on the

thick, beveled front in *H. schmitti*. Actually the margin of the front is a continuation of a margin or shelf (Figs. 1a, 2), 0.1 mm wide, that extends across the front from the base of each fifth anterolateral tooth. The surface of the carapace rises from the inner edge of this shelf. The shelf is evident in *H. paulensis* but not on *H. angustifrons* or *H. caribbaeus*. It is much more prominent in our smaller specimens of *H. paulensis* than in ones as large as the holotype.

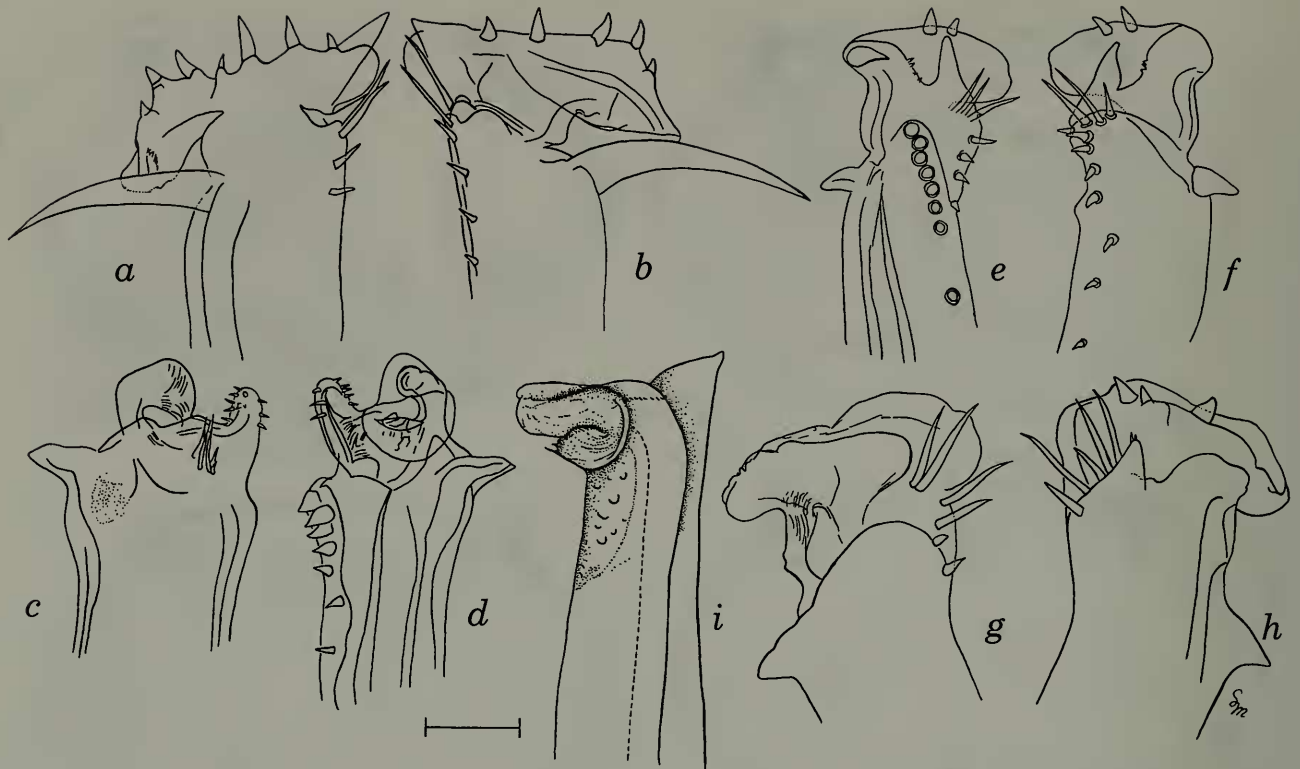


Fig. 5. Sternal (a, c, e, g, i) and abdominal views (b, d, f, h) of apex of gonopod of species of *Hexapanopeus* from Brazil. a, b, *Hexapanopeus caribbaeus* (Stimpson), male, cl 7.0 mm, Santa Catarina, USNM 61803; c, d, *Hexapanopeus paulensis* Rathbun, male holotype, cl 7.0 mm, Santos, USNM 61136; e, f, *Hexapanopeus schmitti* Rathbun, male holotype, cl 9.4 mm, Bay of Rio de Janeiro, USNM 59831; g, h, *Hexapanopeus schmitti* Rathbun, male, cl 5.0 mm, Pitangui; i, *Hexapanopeus angustifrons* (Benedict & Rathbun, 1891) (from Williams 1965:fig. 183D; not based on specimen from Brazil). Scale = 0.2 mm (a-h only).

Hexapanopeus caribbaeus lacks the large basal tooth on the dactylus of the cheliped that is found in *H. angustifrons*, *H. paulensis*, and *H. schmitti*.

Most species of *Hexapanopeus* have five well developed anterolateral teeth. The two species that have the anterior four teeth well developed and the fifth vestigial, *H. beebei* and *H. caribbaeus*, also have a long, tapering lateral process on the apex of the gonopod, and in these two characteristics differ from the type species of *Hexapanopeus*, *H. angustifrons*. This suggests that these two species should be removed from *Hexapanopeus* and placed in a new genus, an action that is beyond the scope of the present paper.

Rathbun (1930:394) pointed out that "Small specimens are easily mistaken for *Panopeus permudensis* on account of the similarity of the granulate lines of the carapace, but they can be identified by the character of the lateral teeth, the thick front,

the texture of the palms, and the extension of the color of the finger in the male."

Key to Brazilian species of *Hexapanopeus*

1. Anterolateral teeth 5, fifth well developed, lateral. Apex of gonopod blunt, lacking long, tapering lateral process 2
 - Anterolateral teeth 4, fifth minute, almost posterolateral. Apex of gonopod with long, tapering lateral process *H. caribbaeus*
2. Carpus of cheliped not markedly tuberculate. Color of fixed finger of chela extending proximally and dorsally onto palm 3
 - Carpus of cheliped with about 15 irregularly placed tubercles. Color of fixed finger of chela barely extending onto palm. [Apex of gonopod trilobate] *H. paulensis*
3. Edge of front thick, beveled. Apex of gonopod a single rounded lobe, with 2-3 apical spines *H. schmitti*

- Edge of front not thick or beveled. Apex of gonopod subtriangular, lacking apical spines *H. angustifrons*

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